

**Figure 1: Genomic constitution of certain *Brassica* species (U, 1935).**  
**Amphidiploids listed in bold text**

<i>Brassica rapa</i> Diploid Genome - AA	<i>Brassica juncea</i> <b>Amphidiploid</b> Genome - AABB	<i>Brassica nigra</i> Diploid Genome - BB
<i>Brassica napus</i> <b>Amphidiploid</b> Genome - AACC		
<i>Brassica oleraceae</i> Diploid Genome - CC	<i>Brassica carinata</i> <b>Amphidiploid</b> Genome - BBCC	

**Figure 2: Breeding procedure used to develop herbicide tolerant  
*Brassica juncea***

Females	Male
Bulk population from 16 <i>Brassica juncea</i> breeding lines low glucosinolate (9-18 umoles) low erucic acid (<1%)	46A72
Crossed to produce the F1	
Female	Males
F1 from previous cross 13 F1 lines x 15 plants per line Selected with Pursuit® 50ml/ha a.i. Chose resistant plants for crossing	Bulk pollen from 16 breeding lines – F5 to F8 generation low glucosinolate (<8 um) low erucic acid (< 0.5%)
Crossed to produce BC1	
Female	Males
BC1 populations from previous cross 6 BC1 populations x 36 plants per line Selected with Pursuit® - 50 ml/ha a.i. Chose resistant plants for crossing	Bulk pollen from 16 breeding lines – F5 to F8 generation low glucosinolate (<8 umoles) low erucic acid (<0.5%)
Crossed to produce BC2	
Female	Males
BC2 seed from previous cross 4 BC populations Selected with Pursuit® – 50 ml /ha a.i. Chose resistant plants for crossing	Bulk pollen from 3 breeding lines – F6 generation low glucosinolate (6 to 12 umoles) low erucic acid (<0.5%)
Crossed to produce BC3	
Stable <i>juncea</i> phenotype combined with Pursuit® tolerance Lines coded: 98SJ-23841, 98SJ-23844, 98SJ-23845	

**Figure 3: Greenhouse and field evaluation of Herbicide tolerant  
Brassica juncea populations**

**Greenhouse evaluation 1 – verify tolerance and juncea phenotype**

98SJ-23841, 98SJ-23844, 98SJ-23845 and unstable BC3 sister lines planted for herbicide tolerance evaluation

Pursuit® applied at 50 ml/ha a.i.; juncea phenotype stable

Survivors self pollinated and harvested

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**Greenhouse evaluation 2 – verify tolerance and juncea phenotype**

Survivors from previous project planted for herbicide tolerance evaluation

Pursuit® applied at 50 ml/ha a.i.; juncea phenotype and tolerance stable in 98SJ-23841, 98SJ-23844 and 98SJ-23845

Survivors self pollinated and harvested

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**Field evaluation 1 – verify tolerance and juncea phenotype under field conditions**

Pioneer Hi-Bred International Puerto Vallarta Mexico Research Station

Self-pollinated selections from all other previous projects were planted at a single location

Odyssey® was applied at 30g/ha a.i.

Juncea phenotype stable – tolerance present in 98SJ-23841, 98SJ-23844 and 98SJ-23845 progenies

Other material derived from other generations and breeding lines exhibited a range of tolerance ranging from fully resistant, intermediate resistant and susceptible. Plant phenotypes ranged from full *Brassica napus* to *Brassica juncea* phenotypes and lines and populations that exhibited traits that were intermediate between *Brassica napus* and *Brassica juncea*. In these other materials, full resistance to the herbicide was not associated with the juncea phenotype, and vice-versa.